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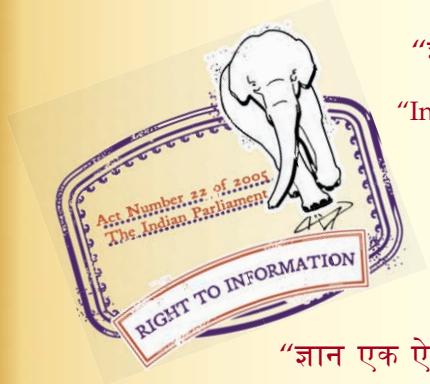

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IS : 7883 - 1975
(Reaffirmed 1999)

Indian Standard

SPECIFICATION FOR ALUMINIUM-MANGANESE ALLOY SHEET AND STRIP FOR AIRCRAFT PURPOSES (ALLOY NO. 31000)

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Indian Standard

SPECIFICATION FOR ALUMINIUM-MANGANESE ALLOY SHEET AND STRIP FOR AIRCRAFT PURPOSES (ALLOY NO. 31000)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 28 November 1975, after the draft finalized by the Light Metals and Their Alloys Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard has been prepared to cover the requirements for aluminium-manganese alloy sheet and strip (of moderate strength, good weldability and workability and good corrosion-resistance) used in the manufacture of aircraft components.

0.3 During the preparation of this standard, assistance has been derived from the following standards:

BS 3L 59 : 1973 Sheet and strip of aluminium-manganese alloy (three-quarter hard). British Standards Institution.

BS 3L 60 : 1973 Sheet and strip of aluminium-manganese alloy (one-quarter hard). British Standards Institution.

BS 3L 61 : 1973 Sheet and strip of aluminium-manganese alloy (soft). British Standards Institution.

QQ-A-250/2d-1970 Aluminium alloy 3003, plate and sheet. US Federal specification.

GOST 12592-1967 Aluminium and aluminium alloys structural sheets (Grade AMu). Gosudarstvennyj Komitet Standartov, Mer i Izmeritel'nyh Priborou SSSR (USSR).

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard covers the requirements for aluminium-manganese alloy sheet and strip used for fabrication of aircraft components.

2. INSPECTION AND TESTING PROCEDURE

2.1 This standard shall be used in conjunction with IS:3420-1969*.

3. FREEDOM FROM DEFECTS

3.1 All sheets and strips shall have clean, uniform, and smooth flat surfaces and shall be free from harmful defects, such as, blisters, laminations, buckles, deep scratches and discolouration in patches. (However, discolouration due to heat treatment shall not be a cause for rejection.) Any sheet or strip shall be rejected for faults in manufacture irrespective of its conformity to chemical composition and mechanical tests.

4. CHEMICAL COMPOSITION

4.1 The chemical composition of the material, when analysed in accordance with IS:504-1963†, shall satisfy the requirements given in Table 1.

TABLE 1 CHEMICAL COMPOSITION

CONSTITUENT	PERCENT
Manganese	0·8 to 1·5
*Copper, *Max*	0·10
*Magnesium, *Max*	0·10
Silicon, *Max*	0·60
Iron, *Max*	0·70
*Nickel, *Max*	0·20
*Zinc, *Max*	0·10
*Lead, *Max*	0·05
*Tin, *Max*	0·05
*Titanium, *Max*	0·15
*Chromium, *Max*	0·05
Aluminium	Remainder

*Subject to the discretion of the inspecting authority, determination of these constituents need be made on a small proportion only of the samples analysed.

*Procedure for inspection and testing of aluminium and aluminium alloys, sheet and strip (for aircraft purposes).

†Methods of chemical analysis of aluminium and its alloys (*revised*).

4.1.1 For the making of alloy for sheet and strip, aluminium complying with IS:23-1965* and alloying constituents with or without approved scrap (at the discretion of the manufacturer) shall be used.

5. CONDITION

5.1 Sheet and strip shall be supplied in one of the following conditions according to IS : 5052-1969†:

0, H1, H2, H3 and H4.

6. MECHANICAL PROPERTIES

6.1 The mechanical properties obtained from the test pieces selected and prepared in accordance with IS : 3420-1969‡ and tested in accordance with IS : 1816-1961§ shall comply with the requirements given in Table 2.

TABLE 2 MECHANICAL PROPERTIES

Condition	Tensile Strength N/mm² (kgf/mm²)	Elongation on 50-mm Gauge Length, Percent, *Min*			
		0·5 mm to 0·8 mm	Over 0·8 mm to 1·4 mm	Over 1·4 mm to 3·0 mm	Over 3·0 mm to 6·0 mm
(1)	(2)	(3)	(4)	(5)	(6)
0	90 to 130 (9·2 ,, 13·2)	20	23	24	25
H1	120 to 145 (12·2 ,, 14·8)	5	6	7	8
H2	135 to 180 (13·8 ,, 18·3)	3	4	5	5
H3	160 to 195 (16·3 ,, 19·9)	2	3	4	4
H4	185, *Min* (18·9, *Min*)	1	2	3	4

7. DIMENSIONAL TOLERANCES

7.1 The dimensional tolerances for sheet and strip shall be as given in IS : 3420-1969‡.

*Specification for primary (virgin) aluminium notched bars and ingots for remelting for aircraft purposes (*second revision*).

†Temper designations of aluminium and its alloys.

‡Procedure for inspection and testing of aluminium and aluminium alloys, sheet and strip (for aircraft purposes).

§Method for tensile test for light metals and their alloys.

8. IDENTIFICATION

8.1 Each sheet and strip approved by the inspector shall be stamped with the mark of the inspector and such other marking as shall ensure full identification of the material.

8.2 One side of each sheet and strip approved by the inspector shall be marked all over with the specification number, alloy number, condition and the manufacturer's identification symbol.

9. CORROSION PREVENTION

9.1 The identified sheets and coils of strips shall be coated with suitable temporary protective with or without interleaving non-corrosive paper (oil paper, etc) before transit or storage.

10. PACKING

10.1 Unless otherwise specified, the sheets and strips shall be greased and packed with interleaving paper to avoid any chafing. Grease and paper shall be neutral and non-corrosive. The whole package shall be wrapped in strong waterproof paper in such a way as to avoid ingress of moisture, dust, etc, and shall be placed in a box or crate with a view to prevent any displacement of sheet metal. Gluing of sheet surfaces with neutral sticky paper in places is also permissible to prevent chafing in place of interleaving paper.

11. CERTIFICATION

11.1 All supplies shall be accompanied by certificates for freedom from defects, chemical composition of the material, condition, mechanical properties as laid down in **3.1**, **4.1**, **5.1**, and **6.1** or as required by the inspecting authority.

11.2 The manufacturer shall, when required, supply free of charge a copy of the works analysis of the material. Works analysis is defined as the routine analysis conducted by the manufacturer in order to control the quality of the material.

(*Continued from page* 2)

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ALUMINIUM AND ALUMINIUM ALLOYS FOR AIRCRAFT PURPOSES

IS:

23-1965 Primary (virgin) aluminium notched bars and ingots for remelting for aircraft purposes (*second revision*)

202-1966 Aluminium casting alloy ingots and castings for aircraft purposes (*second revision*)

2304-1962 Procedure for inspection and testing of light metals (aluminium and magnesium) and their alloy ingots and castings for aircraft purposes

3420-1969 Procedure for inspection and testing of aluminium and aluminium alloys, sheet and strip (for aircraft purposes)

3435-1968 99 percent secondary aluminium notched bars and ingots for remelting for aircraft purposes

3436-1966 Aluminium-clad aluminium alloy sheet, strip and coil for aircraft purposes

5902-1970 Aluminium and aluminium alloy rivet stock for cold forged rivets for aircraft purposes

7428-1974 Aluminium and aluminium alloys extruded bars, rods and sections (for aircraft purposes) (alloy No. 24345)

7429-1974 Procedure for inspection and testing of aluminium and aluminium alloy extruded bars, rods and sections (for aircraft purposes)

7670-1975 Aluminium alloy forging stock and forgings (for parts operated at elevated temperatures) for aircraft purposes (alloy 22588)

7674-1975 Procedure for inspection and testing of aluminium alloy forging stock and forgings for aircraft purposes

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